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ing. Investigation of the properties of the various soils. Inferences as to the function of each.

III. Comparison of plants. Classification as to locality. Comparison of herbaceous plants of the different areas as to roots, stems, and leaves. Recording of obvious reasons for the differences noted. Comparison of trees found in different areas. Examination of twigs to show manner and rate of growth; relation of trees to birds and insects; recording of observations in writing, drawing, and painting. Economic value of trees, wood, fruit, seeds, bark and roots.

IV. Comparison of animals. Classification as to locality. Record of insects seen. Method of

identification. Insects which aid plants. Insects which injure plants. Work of animals in the different soils. Record of birds seen. Identification from description. Imitation of bird notes. Comparison of birds seen as to: (a) Manner of flight. (b) Kind of food. (c) Manner of nesting.

At the end of six weeks a stereopticon entertainment will be given by the children. In it the children of each grade will describe what they have seen, done, and made for the benefit of the others, and this entertainment will be the apparent motive for some of the close observation at the Museum and in the field. Many of the slides used will be made from pictures taken upon the trips.

Geography for the Fourth Grade, Correlated with the Study of Local Conditions

Katharine M. Stilwell

Motive—To show the relation of shore lines to the settlement and development of any region. Material—Writing, painting, drawing, and modeling material, compass, clinometer, pictures, camera, stereopticon, maps, reading matter, and materials for the various experiments to be made. Method—Field work and class discussion.

I. Field Work.—1. Shore of Lake Michigan north of Chicago, sandy beach at Edgewater, cliffs at Winnetka, coastal plain at Waukegan, Ill., and the sand dunes at Dune Park, Ind. 2. Points to be observed: (a) Shore currents and the processes of erosion in cliffs, terraces and cliffs; the starting of river valleys in the form of gullies. (b) The formation of beaches, spits, barriers, terraces, dunes, and deltas. 3. Children sketch the various forms observed. 4. Collect specimens of rock, sand, and pebbles. 5. Photograph salient features for further study.

II. Class Study will be continued by means of oral discussion and other forms of expression, as partially indicated below, and by the use of stereopticon views, and other pictures presented by the teacher. 1. Expression—Making clinometers and field bags. Painting or sketching the various land forms, and illus-

trating erosion and deposition. Drawings illustrating experiments. Modeling the land forms observed. Experiments as needed to explain points under consideration. Children will be led to devise their own experiments. Writing used continually as a means of expression of thought. Reading papers written by children, as well as articles from different sources, giving information on the topics of study. This reading will be used (a) to supplement the knowledge gained by observation, (b) as a means of acquiring information not otherwise to be gained.

2. Points to be considered: (a) Situation of Chicago with reference to the lake shore; cause of this location. (b) Topographical features of the lake shore. The character and amount of work done on the following topics will be determined by the attitude of the class toward it:

(b¹) Littoral Erosion. Agent—The wave. Process—(Class observe. Illustrate). Conditions favoring and retarding erosion. Effect of gravity. Weathering. Forms of land produced by erosion. Sea cliffs and wave-cut terraces.

(b²) Littoral Transportation. Agent—Joint action of waves and currents. Observation as to method. Direction of wind. Shore drift or beach, and barriers; relation of the two; history of lagoons. Class will determine

(through experiment) the relation of the transporting power to velocity, volume, and slope.

(b³) Littoral Deposition. Material: Shore drift, detritus delivered by streams. Conditions of deposition determined by observation and experiment. Effect of fresh water, salt water, volume, and velocity. Manner of sorting and depositing. Land forms: Spit, bar, hook, wave-built terrace. Show pictures of these as formed in the Great Lakes. Use United States Engineer maps. Deltas: How made. Conditions necessary. Some important ones. Their effect. Sand Dunes: (not an essential feature, but often present.) Where formed. Process. Conditions necessary. Shape and height of dunes at Dune Park. Relation to the prevailing wind. Shape, size, and arrangement of material. Value of dunes to the coast. Migrating dunes.

(c) Bearing of these shore features on the location and development of Chicago. Other factors in the city's growth.

(d) Study of other shore lines. Their effect upon settlement, harbors, commerce, fishing, climate, vegetation, and naval power of country. Shore of New England. Shore of

Virginia and South Carolina. Coast of England. Fiords of Norway. Use pictures from picture collection and stereopticon views.

READING FOR PUPILS.

Stories of Dunes in France and Holland, C. N. S. Leaflets, McIntyre; *Waters of the Ocean*, Geographical Readers, Albert; *Coast of England*, Geographical Reader, No. 2, Blackwood's; *This World of Ours*, Arnold-Forster; *Deltas, Coast of England*, Geographical Reader, Standard 3, Chambers; *North America*, Carpenter; *Geographical Reader*, King.

REFERENCES FOR TEACHERS.

Rocks and Rock Weathering, Merrill; *Geography of Chicago and Its Environs*, Geographical Society Bulletin, No. 1; *Common Minerals and Rocks*, Crosby; *Short History of Great Lakes*, Shaler; *Studies in Indiana Geography*, Dryer; *U. S. Geological Survey*, Fifth Annual Report, Vol. I.; *Geology of Wisconsin*, Chamberlain; *Geology of the Henry Mountains*, Gilbert; *Monographs of National Geographical Society, Shore Line Topography*, Gulliver; Vol. XXIV., No. 8, *Proceedings of American Academy of Arts and Sciences*.

History Lessons for Fourth Grade, Correlated with Study of Local Conditions

Clara I. Mitchell

General Subject—Building of a City.

1. Environment of our own life compared with that of a man of the Stone Age—(1) in a forest, (2) in a mountainous or hilly district, (3) on a plain, (4) near a body of water.

Influence of each kind of environment in determining methods of food-getting, clothing, protection, and social life.

2. Hunter's life as satisfying in the most primitive way man's need of food and clothing; illustrated by neolithic man of western Europe. Beginnings of industrial arts brought about by the activities of hunter life. (a) Chipping of stone for weapons. (b) Sewing of skins by means of bone needle. (c) Basket-weaving. (d) Invention of pottery.

Beginnings of science discovered and applied in: (a) Use of stone ax. (b) Invention of bow and arrow. (c) Observation of plant and animal life. (d) Knowledge of meteorological conditions. (e) Use of fire and cooking. (f) Use

of trees, caves, caverns, rocks, and bodies of water as affording protection for dwellings. Beginnings of religion in nature worship.

3. Pastoral life. Illustrated by early Aryan tribes of Central Europe. Dependence upon animal food leading to domestication of animals and the life of herding. Dog, ox, sheep. Necessity for pasturage leading people from mountains to grassy plains. Possession of herds the beginning of property-holding. Necessity for the protection of property. Gathering of individuals into communities for mutual protection. Communal life. Families, clans, tribes.

Beginnings of building. Rude huts for habitation. Use of upright posts as supports and slanting roof for drainage. The walled village. Community life demanding the division of labor. Need of law in regulation of community life. Idea of leadership. Choice of leaders. Patriarchal form of government.